

WHAT IS CLAIMED IS:

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- 5 1. A method for preparing a manganese compound for a lithium manganese complex oxide, comprising the step of simultaneously applying a mechanical force and a heat energy to a manganese compound to remove defects present in particles of said manganese compound, and to control the aggregation of micro particles and the shape of the aggregated particles.
- 10 2. The method for preparing the manganese compound according to claim 1, wherein a mechanical force and a heat energy are simultaneously applied to said manganese compound with adding one or more kinds of preparations selected from the group consisting of LiOH, LiOH · H<sub>2</sub>O, LiCH<sub>3</sub>COO, LiCHO, LiCHO · H<sub>2</sub>O, LiNO<sub>3</sub>, and a transition metal salt having a melting point of 200 °C or less.
- 15 3. The method for preparing the manganese compound according to claim 2, wherein the amount of said preparations is 0 to 20 wt% of the manganese compound.
- 20 4. The method for preparing the manganese compound according to claim 1, wherein said manganese compound is selected from the group consisting of electrolytic manganese dioxide (MnO<sub>2</sub>; EMD), chemical manganese dioxide (MnO<sub>2</sub>; CMD), Mn<sub>2</sub>O<sub>3</sub> and Mn<sub>3</sub>O<sub>4</sub>.
- 25 5. The method for preparing the manganese compound according to claim 2, wherein said manganese compound is selected from the group consisting of electrolytic manganese dioxide (MnO<sub>2</sub>; EMD), chemical manganese dioxide (MnO<sub>2</sub>; CMD), Mn<sub>2</sub>O<sub>3</sub> and Mn<sub>3</sub>O<sub>4</sub>.
- 30 6. The method for preparing the manganese compound according to claim 1, wherein the applied mechanical force is 0.1 to 1000 dyne/cm<sup>2</sup>, the range of the temperature of the applied heat energy is 50 to 200 °C, and the applied time is 5 minutes to 5 hours.
7. The method for preparing the manganese compound according to claim 2, wherein the applied mechanical force is 0.1 to 1000 dyne/cm<sup>2</sup>, the range of the temperature of the applied heat energy is 50 to

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200 °C, and the applied time is 5 minutes to 5 hours.

8. The method for preparing the manganese compound according to claim 1, wherein a manganese compound having a shape without edge parts is prepared by using an angular shaped manganese compound as a raw material and applying mechanical force and heat energy.

9. The method for preparing the manganese compound according to claim 2, wherein a manganese compound having a shape without edge parts is prepared by using an angular shaped manganese compound as a raw material and applying mechanical force and heat energy.

10. A method for preparing lithium manganese complex oxide with a spinel structure, comprising the steps of:

a) mixing

(i) a manganese compound prepared by the method comprising the step of simultaneously applying a mechanical force and a heat energy to a manganese compound to remove defects present in the particles of said manganese compound and to control the aggregation of micro particles and the shape of the aggregated particles; and

(ii) a lithium compound ; and

b) calcining the mixture prepared in said step (a).

11. A method for preparing a lithium manganese complex oxide with a spinel structure according to claim 10, wherein the (ii) lithium compound of step (a) is selected from a lithium salt group consisting of LiOH, LiOH · H<sub>2</sub>O, LiCH<sub>3</sub>COO, LiCHO, LiCHO · H<sub>2</sub>O and LiNO<sub>3</sub>.

12. A method for preparing the lithium manganese complex oxide with a spinel structure according to claim 10, wherein the temperature of calcination of said step (b) is 400 to 900 °C, and the time of calcination is 1 to 30 hours.

13. A method for preparing the lithium manganese complex oxide with a spinel structure according to claim 11, wherein the temperature

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of calcination of said step (b) is 400 to 900 °C, and the time of calcination is 1 to 30 hours.

14. A lithium or lithium ion secondary battery comprising an anode, an electrolyte and a cathode using a lithium manganese complex oxide powder with a spinel structure as an active material, wherein said  
5 active material is a lithium manganese complex oxide with a spinel structure prepared by the method comprising the steps of:

a) mixing

(i) a manganese compound prepared by the method comprising the  
10 step of simultaneously applying a mechanical force and a heat energy to a manganese compound to remove defects present in particles of the manganese compound and to control the aggregation of micro particles and the shapes of the aggregated particles; and

(ii) a lithium compound; and

15 b) calcining the mixture.

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